



STATE OF WASHINGTON DEPARTMENT OF FISH AND WILDLIFE



DROUGHT CONTINGENCY PLAN and 2005 Drought Response Close-out Report

November 30, 2005

1. Purpose

The Washington Department of Fish and Wildlife (WDFW) Drought Contingency Plan provides a process and procedure for anticipating, identifying and responding to the impacts of drought on fish and wildlife resources. The plan facilitates coordination of WDFW planning and actions internally and with state, federal, local and tribal entities. It also serves to inform and utilize Washington's citizens in understanding and responding to drought issues related to fish and wildlife.

2. Organizational Framework

Executive Water Emergency Committee: WDFW is a member of the Executive Water Emergency Committee (EWEC), chaired by the Governor's Office. The EWEC functions as the top-level decision-making body in assessing the overall effects of a drought and formulating a coordinated state response. The EWEC is made up of a combination of state agencies affected by drought conditions. It includes representatives from the state departments of Ecology, Agriculture, Health, Natural Resources, the Office of Community Development, the Emergency Management Division, the state Energy Office, the Fire Marshall's Office, and the Conservation Commission. EWEC regularly meets jointly with the Water Supply Availability Committee chaired by Ecology. That group includes representatives of the NOAA Weather Service, the Corps of Engineers and the National Resource Conservation Service. The EWEC also coordinates drought activities with other states and Canada as necessary. The EWEC may convene a number of specialized task forces as deemed appropriate, including a Fish and Wildlife Task Force, chaired by WDFW. The EWEC may meet in mid-winter annually to facilitate on-going drought planning and preparedness throughout the state and to maintain agency commitments and contacts for drought issues. Staff from WDFW's Intergovernmental Resource Management unit represent the agency on EWEC and chair the Fish and Wildlife Task Force.

Emergency Drought Operations Center: WDFW provides staff to the Ecology Emergency Drought Operations Center (EDOC). Ecology, as the state agency entrusted with the management of the state's water resources serves as the lead agency in coordinating state agencies' responses to drought. Ecology, upon consultation with EWEC and the Water Supply Availability Committee and with the written approval of the Governor, can issue a drought declaration, pursuant to RCW 43.83B.405. The declaration can be state-wide or can be restricted geographically, depending on the severity of water supply shortages and expected

hardships. Emergency rules for augmenting water supplies and mitigating the effects of drought on fish and wildlife will then take effect in those areas. Applications for emergency water rights, funding for agricultural and municipal infrastructure, and projects to minimize drought effects on fish and wildlife are coordinated through EDOC. Throughout the course of a drought, Ecology will act as the state clearinghouse for drought information. Drought declarations usually last until the end of the calendar year in which they are issued or may be rescinded statewide or geographically if conditions improve sufficiently to abate the emergency. WDFW public affairs staff participate in the Joint Information and Education Task Force, which meets bi-weekly to exchange information and provide drought-related news releases and other information.

WDFW Internal Drought Response Coordination Team: The WDFW Internal Drought Response Coordination Team (Coordination Team) includes representatives from the agency programs and the regional directors. Its purpose is to prepare a comprehensive agency response to the drought. The committee is tasked with developing the agency Drought Contingency Plan that should identify:

- The agency's drought risks and liabilities.
- Actions that can be taken within existing agency budgets to address those risks and liabilities.
- Preparation and implementation of drought impact minimization projects that could be funded from a variety of sources, including direct legislative funding for the agency, funding from state drought emergency and drought preparedness accounts, and/or federal funding
- Funding shortfalls that could result from responding to the drought.
- Ways to coordinate across programs to ensure an efficient response to the drought.

The WDFW drought plans should be consistent with and complement the Washington State Drought Contingency Plan.

The Coordination Team is chaired by the WDFW Drought Response Coordinator. This is a non-permanent position staffed in response to the drought declaration with funding from the state drought accounts. The team meets as needed to complete its tasks.

WDFW Drought Response Team: The Drought Response Team includes the Drought Response Coordinator, an IRM water policy analyst, field coordinators (2), budget/accounting expertise and a public information officer. The purpose of the team is to assist in the preparation of the agency drought contingency plan and to coordinate day-to-day implementation of the plan. The team meets weekly or as needed to complete its tasks.

3. WDFW Drought Risks And Liabilities

Potential drought impacts facing fish and wildlife, agency programs, and agency constituents include:

Fish

- Direct impacts to fish in streams, estuaries, reservoirs and lakes:
- Blockages to upstream adult salmonid migration and spawning
- Low flows and critical high temperatures during late spring, summer and early fall months
- Increased mortality of returning adult salmon due to low water, high temperatures, crowding and low dissolved oxygen.
- Rearing and spawning habitat will be compressed or unavailable with reduced flow.
- Stranding of juvenile salmonids due to low flows in streams and irrigation ditches.
- Fish mortalities in severely drawn down reservoirs and from other flow manipulations.
- Hatchery fish will need more frequent medications due to virulence of disease organisms at lower flows and higher water temperatures.
- Fish may need to be released earlier or relocated to safe havens, which results in higher trucking costs and increased handling stress and mortalities.
- Hatchery intakes and wells may need to be modified to provide adequate water supply
- Temporary weirs will need to be installed and increased efforts may be necessary to collect adult fish.

Wildlife:

- Terrestrial water shortages for birds, small game, and big game.
- Impacts to waterfowl amphibians and other species as wetlands recede.
- Loss of forage grasses and shrubs.
- Increased disturbance, road kill, and predation and incidents of problem and dangerous wildlife as animals are forced to seek water food near more populated areas.

Lands Operations:

- Wild fires and associated habitat destruction.
- Hay production, fencing and other capital improvements could be impacted resulting in higher costs.
- Potential temporary transfer of agency water rights to augment low stream flows Curtailment or reduced use of irrigation diversions and loss of wildlife

benefits.

- Boating and land access areas may be closed due to low water or fire danger, reducing both public opportunity and license sales.
- Fish passage at stream crossings may be impaired.

Habitat Operations

- Hydraulic Project Approval permit load may increase.
- Staff time spent investigating work done without permits may increase
- Review of Ecology water rights, transfers and leases will increase.
- Involvement with water purveyors and hydroelectric systems will be increased and more focused on drought-related stream flows.

Enforcement Operations

- Increased enforcement effort to combat animal damage to agricultural crops and to respond to dangerous wildlife incidents as animals are driven away from natural habitats by fire or in search of forage and water.
- Increased enforcement presence on WDFW lands to combat fire threat.
- Increased enforcement presence on spawning streams, and in fisheries due to vulnerability of salmon stocks
- Increased enforcement efforts in support of federal, state and local fire-suppression activities during wildfires.
- Increased enforcement presence to address Hydraulic Project Approval issues.
- Increased enforcement presence to address illegal water diversion structures.

Business Services Operations

- Potential significant decrease in hunting and fishing license sales due to fire closures and other fishing or hunting restrictions. Energy costs are expected to rise dramatically, especially at hatcheries and fish rearing facilities that depend wholly or in part on pumped well water.

4. Drought Impact Mitigation Actions Needed

WDFW anticipates that the following actions will be necessary, wholly or in part, to minimize the anticipated impacts of drought on fish, wildlife, lands and agency operations. The extent to which we will take these actions will depend upon the severity, scope and duration of drought impacts, our ability to take action within agency capabilities and the amount and flexibility of additional funds that may be available for drought.

General

- Organize internally to identify fish and wildlife drought risks, liabilities and actions. Establish an Internal Drought Response Coordination Team, and Drought Response Coordinator position.
- Serve as a member of the Executive Water Emergency Committee.
- Act as chair of the Fish and Wildlife Task Force when activated by EWEC.
- Serve as a member of the interagency Emergency Drought Operations Center
- Serve as a member of the Wildfire and Forest Closures Task Force, the Agriculture Task Force, Economic Impacts Task Force, the Energy Task Force, the Municipal/Domestic Supply Task Force, and the Business, Employment, and Community Assistance Task Force as required.
- Reduce water consumption at WDFW buildings and lands

Funding

- Seek emergency funding to implement measures to protect agency facilities and fish and wildlife resources.

Fish Habitat

Protect freshwater and marine fish habitat and prevent fish mortality during drought conditions, including:

- Augment stream flows through acquisitions, temporary source exchanges, or leases and/or transfers of surface and groundwater rights.
- Work with water managers on controlled streams to assure adequate and proper consideration is given to fish needs. Try to reach agreements that will minimize water-use conflicts and impacts on fish and wildlife resources
- Monitor streams and implement actions as necessary to provide for fish passage. Channel modifications (such as trenching, sandbagging, or berming), temporary fishways, trapping and hauling, or other alternatives may be implemented
- Monitor water quality and, as needed, develop and encourage water quality improvement measures such as recommending increased stream flows on regulated waters, recommending or negotiating temporary variance in wastewater discharges, or acquiring water. Where necessary, implement rescue operations to relocate fish from lakes and reservoirs suffering poor water quality or drawn down conditions that affect fish passage.

Fish Hatcheries and Rearing Facilities

- Monitor for and respond to disease problems as they occur. Agency fish pathology experts should frequently consult with individual hatchery personnel to address such problems.

- Prioritize and implement drought response projects at fish hatcheries, fishways, and rearing facilities to protect fish during drought conditions. Projects may include:
 - Installation of water re-use pumps where expected needs exist.
 - Drilling new wells for temporary use, or deepening existing wells to maintain water supply.
 - Modify stream channels or make use of temporary fish collection weirs as necessary to ensure fish passage to hatcheries.
 - Modify hatchery water intake and outlet structures to minimize drought impacts to water supplies.
 - Minimize drought-related problems by modifying hatchery operations, such as reducing fish density, transferring fish to another facility, or implementing early fish releases.
 - Modify fishways to efficiently pass fish during low flow conditions.
 - Manage dissolved oxygen levels in holding and rearing ponds with the use of bottled gas, oxygen generator systems, or mechanical aeration.

Wildlife and Lands

Prioritize and implement programs to sustain wildlife and protect public and private property, including:

- Implement an emergency winter feeding program when necessary to ensure survival of wildlife. This includes determining and authenticating when emergency winter conditions will have seriously impact wildlife, and preparing a request for assistance to be forwarded through the US Fish and Wildlife Service. Upon approval, the Commodity Credit Corporation can provide certificates for surplus grain.
- Supply forage (hay) for big game animals to minimize damage to private agricultural crops, particularly during the winter following a drought.
- Manage Wildlife Areas to provide additional forage for wildlife as necessary, such as reducing grazing leases, especially on winter range.
- Fertilize rangeland to increase wildlife cover and forage during the following winter.
- Increase capability to capture and relocate dangerous wildlife that may come in close proximity to the public in search of food or water, or to flee wildfires.
- Construct fences and other exclusion structures to restrict wildlife access in selected areas where property damage is likely.
- Prioritize and implement actions to protect water sources for fish and wildlife, including:
 - Where needed, temporarily impound or divert water to critical habitats or to upland watering devices
 - Protect natural water sources by fencing and other infrastructure, such as piping and stock tanks, to provide water while preventing damage to sources
 - Maintain safe and efficient boating access ramps at agency facilities

Endangered Species Act and Essential Fish Habitat

Ensure that drought-related protection measures do not result in an unauthorized take of fish and wildlife protected under the Endangered Species Act and do not result in an adverse impact to Essential Fish Habitat as defined in the Magnuson/Stevens Fishery Conservation and Management Act.

WDFW Hydraulic Code

- Assess and implement temporary changes as needed to the Hydraulic Project Approval (HPA) permit program consistent with the provisions of RCW 43.83B.410.
- Ensure that the drought-related fish and wildlife protection projects undertaken by WDFW are in compliance with the state Hydraulic Code.

State Environmental Policy Act

Ensure that the drought-related fish and wildlife protection projects undertaken by WDFW are in compliance with the State Environmental Policy Act.

Shoreline Management Act

- Ensure that drought-related fish and wildlife protection projects undertaken by WDFW are in compliance with the state Shoreline Management Act.

Public Education and Outreach

- Provide education and information about the impacts of drought on fish and wildlife.

Enforcement

- WDFW enforcement staff should coordinate with agency programs, other agencies and the public to provide an efficient and effective enforcement response for minimizing the effects of drought on fish, wildlife, public safety and public and private property. Specifically:
- Provide enforcement presence to combat animal damage and to deal with dangerous wildlife.
- Provide enforcement presence on WDFW lands to combat fire threat, and coordinate WDFW assistance for wildfire suppression.
- Provide enforcement presence on spawning streams, and in fisheries due to vulnerability of salmon stocks.
- Provide enforcement presence to address additional Hydraulic Project Approval issues.

Drought Contingency Plan Review And Adaptive Management

After the drought response is completed, an assessment of the effectiveness of this plan and impacts on fish and wildlife and agency operations and revenue will be needed. Adaptive management should be employed as necessary to improve the agency's response to future drought emergencies.

5. 2005 Drought Response Close-out Report

Introduction

On March 10, 2005, Governor Gregoire declared a statewide drought emergency, warning state agencies and Washington citizens to prepare for the worst drought since 1977. Across the state, precipitation was at or near record lows, and the mountain snow pack was averaging about 26 percent of normal. Many rivers and creeks on both sides of the Cascades were flowing at or near record-low levels for that time of year. Despite some increased rainfall in late spring and early summer, these conditions persisted through the spring, summer and early fall and posed a continuing threat to state agriculture, forest lands, and fish and wildlife resources.

WDFW was engaged in managing the impacts of the drought on several fronts in our efforts to protect fish and wildlife in the context of the state's overall drought contingency plan. We will not know the full impact of the drought on Washington's fish and wildlife for many years to come, dependent upon how fish and wildlife fared in the face of reduced streamflow for fish spawning and rearing, the severity of the impact of fires across the state on fish, wildlife and agency infrastructure, and the operational constraints placed on our fish hatcheries and rearing facilities.

Organizational Response

In anticipation of the potential for a Drought Declaration, WDFW organized an Internal Drought Response Coordination Team with representatives from throughout the agency (see Table 1) to begin to prepare a comprehensive response to the drought. The committee was specifically charged with identifying:

- The agency's drought risks and liabilities.
- Actions that can be taken to address those risks and liabilities.
- Funding shortfalls that could result from responding to the drought.
- Ways to coordinate across programs to ensure an efficient response to the drought.

Table 1. WDFW Internal Drought Response Coordination Team

Team Member	Representing
Steve Keller – Chair	Intergovernmental Resource Management -WDFW Drought Response Coordinator
Carl Samuelson	Intergovernmental Resource Management – Environmental Affairs
Ross Fuller	Fish Program – Fish Management Division
John Kerwin	Fish Program – Hatcheries Division
Terra Hegy	Habitat Program -Drought Response Team
Dave Nettnin	Habitat Program - Drought Response Team
Perry Harvester (March 15 – August 31)	Habitat Program -Drought Response Team
Lloyd Phinney (March 15 - April 30)	Habitat Program - Drought Response Team
Jon Kohr (from September 1)	Habitat Program -Drought Response Team
Paul Dahmer	Wildlife Program
Glenn Gerth (from June 15)	Business Services Program – Engineering
Bill Phillips (March 1 – June 14)	Business Services Program – Engineering
Lembit Rattasep (March 1 – May 31)	Business Services - Enforcement
Bill Jarman	Business Services - Enforcement
Doug Williams (March 15 – September 30)	Public Affairs
Craig Bartlett (from October 1)	Public Affairs
John Andrews	Regional Director – Region 1
Dennis Beich	Regional Director – Region 2
Jeff Tayer	Regional Director – Region 3
Bob Everitt	Regional Director – Region 4
Guy Norman	Regional Director – Region 5
Sue Patnude	Regional Director – Region 6

Shortly after the Drought Declaration was in effect, the Intergovernmental Resource Management unit recruited Steve Keller to serve as the WDFW Drought Response Coordinator. Keller lead the updating and implementation of the agency’s drought response plan, with assistance from the Drought Response Coordination Committee and the Drought Response Team. The Drought Response Team, which managed the day to day operational details of the WDFW drought response included Steve Keller, Terra Hegy, Perry Harvester, Dave Nettnin, Jon Kohr, Doug Williams, Craig Bartlett and Carl Samuelson.

Keller and Samuelson represented the agency on the Executive Water Emergency Committee, an interagency planning group chaired by the Governor’s Office. The committee, designed to promote interagency coordination on water issues, also included representatives from the state departments of Ecology, Agriculture, Health, Natural Resources, the Office of Community Development, the Emergency Management Division, the state Energy Office, the Fire Marshall’s Office, and the Conservation Commission. EWEC met routinely with the Water Supply Availability Committee that

included the NOAA Weather Service, the Corps of Engineers and the National Resource Conservation Service. EWEC convened in Olympia for six meetings and conducted four public meetings across the state (Wenatchee, Yakima, Spokane and Port Angeles) during the 2005 drought. WDFW participated in these meetings and provided local field and management staff assistance and perspective at each public meeting.

In addition, the WDFW Drought Response Team participated in the Emergency Drought Operations Center (EDOC), a multi-agency group charged with the funding process and day-to-day operational issues of drought impacts mitigation. Led by the Washington Department of Ecology (Ecology), the EDOC also included representatives from the Departments of Agriculture, Health, the Conservation Commission, the Office of Community Development and WDFW. The DOC met bi-weekly (primarily via conference call) from mid-March through September. Steve Keller and Carl Samuelson provided WDFW staff support to committee. Funding requests for operations staff and drought impact mitigation projects were processed through this committee.

On other fronts, WDFW provided enforcement staff to the state Emergency Command Center and was involved with ad hoc, drought-related groups whose objectives included helping to reduce the impacts of drought on fish and wildlife (e.g. Central Puget Sound Water Suppliers Forum, King County Drought Committee, School Fire response). WDFW mounted a huge effort on the School Fire near Dayton, protecting the Tucannon Hatchery from being destroyed and minimizing, where possible the impacts of the fire on WDFW's Wooten Wildlife Area. WDFW actively included treaty Indian Tribes in the drought response, soliciting information on potential fish and wildlife drought impacts and coordinating project implementation with tribal biologists.

Drought Funding

Following the drought declaration, Governor Gregoire submitted a \$12 million supplemental budget request to the state legislature including \$1.8 million that already existed in the state's drought accounts, an additional \$8.2 million in capital funds to buy water, improve wells and implement other water-supply projects and an additional \$2 million in operating funds to support drought permits and assistance programs in the state agencies; including the departments of Ecology, Agriculture, Health, and Community, Trade and Economic Development and WDFW. The legislature funded the Governor's request. From this, \$1.15 million was allocated to WDFW for drought response operations and projects. Of this, \$150,000 was allocated for WDFW drought operations, \$200,000 for 25 early-action projects (Appendix 1) and \$800,000 for 83 anticipated projects and other contingency actions (Appendix 2). Some anticipated projects were eventually not needed or not able to be permitted on a timely basis and were not done. Conversely, as the drought progressed other projects were identified and were added to the list. WDFW and Ecology coordinated frequently regarding the adjustments to the project list.

WDFW and Ecology staff were also able to adapt the state's existing water acquisition program to procure temporary and permanent water rights and leases to further respond

to drought related streamflow impacts on fish and wildlife. Also, because of successful bull trout salvage actions funded by the state during the 2001 drought, the federal Bureau of Reclamation (BOR), has since contributed \$30,000 annually to establish a fund for implementation of similar fish mitigation projects. The fund applies specifically to fish passage projects done by WDFW associated with the BOR Yakima project reservoirs (Lake Kachess, Lake Keechelus, and Rimrock Lake). As a result, state funds are no longer needed for these projects.

Drought Actions, Projects and Outcomes

WDFW staff have been heavily involved with addressing the agency's drought risks and liabilities since mid-March. This section documents actions taken or in-progress through October 2005. Fortunately, March through October conditions evolved such that drought impacts on fish and wildlife were less severe than originally anticipated; thanks to a wet spring with well-timed and targeted rainfall and subsequent stream flows. However, as anticipated, sites that were not initially identified to be problems also surfaced as the season progressed. The following narrative and tables identify 2005 drought-response actions needed and WDFW responses and outcomes (*in italics*):

Fish Habitat

Protect freshwater and marine fish habitat and prevent fish mortality during drought conditions, including:

- Augment instream flows through acquisitions, temporary augmentation with groundwater, or leases and/or transfers of surface and groundwater rights.

WDFW explored the feasibility of "source exchange" with member utilities of the Central Puget Sound Water Suppliers Forum (Forum) on the Pilchuck River, Issaquah Creek and Rock Creek. Source exchange involves one utility deferring surface or groundwater withdrawals where significant benefits to instream flows would result and exchanging the foregone water for water from another utility where inter-tie infrastructure is in place. For example, the City of Snohomish has a surface water withdrawal from the Pilchuck River that may have had significant impacts on instream flows for juvenile salmonids. The City of Everett has a pipeline inter-tie with the City of Snohomish and was willing to sell its water to Snohomish. The cost to Snohomish would be reimbursed from drought emergency funds. This source exchange did not occur because Snohomish was able to reduce its withdrawal to the point that the cost of the Everett water was substantially higher than the minimal benefit to instream flows. However, WDFW should continue to explore source exchange opportunities where they make sense for fish, even in non-drought situations.

- Work with water managers on controlled streams to assure adequate and proper consideration is given to fish needs. Try to reach agreements, which will minimize water-use conflicts and impacts on fish and wildlife resources during drought conditions.

WDFW and the Washington Water Trust successfully negotiated contracts with the Eastside/Westside Irrigation Districts to provide pulse flows in the lower Touchet River and Walla Walla Rivers for the 2005 smolt out-migration period. Pulse flows occur when the irrigators curtail their water use abruptly and for a short period of time. What results is a significant increase in streamflow (pulse) downstream of the points of diversion that mimic a natural rain and stream run-off event. Pulse flows have been used elsewhere, especially by large power and water supply companies and utilities with great success in providing improved passage conditions for both juvenile and adult salmonids. The Walla Walla and Touchet pulse flows proved not to be necessary in 2005 because unanticipated natural rainfall and run-off occurred and the fish migrated naturally. The pulse flows were considered to be experimental. However, the ultimate goal is to have the opportunity to have coordinated rolling flow pulses down the Walla Walla River to move smolts as stream flow and temperature approach critical thresholds. Flow pulses would provide a more cost effective approach to improving passage for salmonids than lower flows over a longer period of time. Agricultural producers are minimally affected and can be compensated for forgone water use on a per acre foot basis.

On the Dungeness River, WDFW participated in an agreement with NOAA Fisheries, the Jamestown S'Klallam Tribe, Ecology and irrigators on the river to provide pulse flows in early September by shutting down ditch withdrawals for a short period (24-26 hours) to provide about a 20% increase in flows to the lower river. Early reports are that the flows worked as intended to induce the upstream movement of several hundred pink and chinook salmon. Without the flows the fish were not moving from the lower river and would have been poorly distributed on their spawning grounds.

Yakima River outmigrations were facilitated by pulse flows provided in early June upon the recommendations of the US Bureau of Reclamation's Yakima Project System Operations Advisory Committee (SOAC). The committee, comprised of water users, fish and wildlife agencies (including WDFW) and the Yakama Tribe, recommended that the USBR provide a pulse flow to be created by a release from reservoir storage. The recommendation was based on Smolt Passage Flow Guidelines developed by SOAC. There were significant numbers of fall Chinook and steelhead delayed by high stream temperatures and lack of natural run-off. The recommendation was to start the pulse flow on June 6, 2005. SOAC has agreed to extend the dates between fish events well beyond the normal 7-day limit, hoping that either a significant fish event or a significant freshet would occur thereby eliminating the need for the use of reservoir storage.

WDFW worked with other utilities across the state (e.g. Seattle Public Utilities, Tacoma Power, Puget Sound Energy, Bonneville Power Authority) within their existing water rights and licensing agreements to ensure adequate flows for fish were being provided, given the drought emergency.

- Monitor streams for potential fish barriers and implement actions as necessary to provide for fish passage. Channel modifications (such as trenching, sandbagging, or

berming), temporary fishways, trapping and hauling, or other alternatives may be implemented to provide for fish passage.

The Drought Response Team worked closely with WDFW, tribal, local government and federal fish biologists and habitat biologists to identify streams and stream reaches where initiation of fish passage projects would be most likely (see Appendix 2 – Temporary Fish Passage Modifications). WDFW staff was guided by an internal document “Considerations for Implementing Drought-related Fish Protection Projects – July 31, 2001. For upstream-migrating adults, this document considered fish species present, migration timing, character of the potential barrier (e.g. riffle depth, jump height, pool depth, water temperature), the actual or potential threat of over-fishing, illegal fishing, disturbance and excessive predation. Passage considerations for down-stream migrating adult or juvenile salmonids included potential or actual dewatering of pools and side-channels, excessive stream temperatures, and migration timing. These areas were routinely monitored for obstructions to fish passage, either by the Drought Response Team, or by other agency and tribal habitat biologists and fish biologists. The potential barriers list changed as the drought progressed, with some projects dropped or modified and additional projects added. Again, due to a combination of planning, a relatively cool summer and timely rainfall and streamflows, WDFW did not have to act on many of the anticipated projects.

In general, migrations were not severely impeded. We had a relatively wet spring, and spates of natural flows at critical junctures (east side snow melt and heavy rains) through the summer months. For the most part, fish were able to migrate freely. However we are concerned where record low flows restricted salmonid spawning to central areas of channels. These areas are more subject to streambed scour and loss of redds when high stream flows occur later in the fall and winter.

We did intervene in several areas to assist adult fish passage. We removed obstructing “recreational” rock dams from the Raging River near Fall City, the Teanaway River near Cle Elum, Taneum Creek near Ellensburg for adult Chinook salmon passage and from tributaries to the Tucannon River near Starbuck for adult bull trout passage. We constructed a fish passage flume for adult bull trout in Box Canyon Creek (Lake Kachess) on Snoqualmie Pass. Cobble flow deflectors were installed for bull trout passage on Gold Creek (tributary to Lake Keechelus) on Snoqualmie Pass, and on Canyon Creek (tributary to the North Fork Nooksak River near Deming) for spring Chinook. A project scheduled for the South Fork Nooksak near Deming for adult coho is pending, but not likely given fall flows. A fish passage channel was excavated across a shallow riffle at the mouth of the Kalama River near Kalama to facilitate Chinook and coho salmon passage. The river channel upstream of the Lyle Falls fishways on the Klickitat River near Lyle was also be modified to facilitate passage through the fishways for adult Chinook, bull trout, coho salmon and steelhead.

Three vegetation removal projects were completed for adult salmon passage. They included Chimacum Creek near Port Townsend benefiting summer chum salmon, and Hamilton and Hardy Creeks near North Bonneville for Columbia River chum salmon. Another canary grass/channel modification/fishway modification project was done on Duncan Creek, also near North Bonneville. We funded and permitted a large-woody - debris flow-deflector project to facilitate upstream passage for adult Chinook and steelhead on the Washougal River near Camas. This project was sponsored and installed by the Lower Columbia River Regional Fisheries Enhancement Group.

Monitor water quality and, as needed, develop and encourage water quality improvement measures such as recommending increased stream flows on regulated waters, recommending or negotiating temporary variances in wastewater discharges, or acquiring water. Where necessary, implement rescue operations to relocate fish from lakes and reservoirs suffering poor water quality or drawn down conditions that affect fish passage.

See above for discussions regarding acquisition of water rights or water leases. WDFW was prepared for implementing fish salvage in the Walla Walla, Tucannon, and Touchet River basins, but timely natural streamflows were sufficient to allow passage of downstream salmonids. WDFW also coordinated with the Yakama tribe at Prosser Dam on the Yakima River on the need to institute trap and haul procedures for downstream-migrating chinook and steelhead, but again a combination of natural and pulsed streamflows enabled these fish to migrate within the river.

Fish Hatcheries and Rearing Facilities

Monitor for and respond to disease problems as they occur. Agency fish pathology experts should frequently consult with individual hatchery personnel to address such problems.

WDFW anticipated disease issues and used drought-relief funding for additional disease-control salt and formalin treatments at several hatcheries (see Appendices 1-3 for funds requested and estimated funds spent)

Prioritize and implement drought response projects at fish hatcheries, fishways, and rearing facilities to protect fish during drought conditions. Projects may include:

- Installation of water re-use pumps where expected needs exist.
- Drilling new wells for temporary use, or deepen existing wells to maintain water supply.
- Modify stream channels or make use of temporary fish collection weirs as necessary to ensure fish passage to hatcheries.
- Modify hatchery water intake and outlet structures to minimize drought impacts to water supplies.
- Minimize drought-related problems by modifying hatchery operations, such as reducing fish density, transferring fish to another facility, or implementing early fish releases.

- Modify fishways to efficiently pass fish during low flow conditions.
- Manage dissolved oxygen levels in holding and rearing ponds with the use of bottled gas, oxygen generator systems, or mechanical aeration.

WDFW anticipated drought related water quantity/quality issues and estimated costs at \$210,200. Estimated actual expenditures, however, are expected to be over \$330,000. This overage can be accommodated within the overall fish and wildlife allocation, however, as other costs came in lower than projected. For instance, the estimated total expenditures for temporary fish passage modifications (Appendix 3) was \$122,500, well under the \$662,000 budgeted. Appendix 4 lists the hatchery projects that were done or will be completed before December 31, 2005.

Wildlife

- Prioritize and implement programs to sustain wildlife and protect the public and private property, including:
- Implement an emergency winter feeding program when necessary to ensure the survival of wildlife. This includes determining and authenticating when emergency winter conditions will have seriously impact wildlife, and preparing a request for assistance to be forwarded through the US Fish and Wildlife Service. Upon approval, the Commodity Credit Corporation can provide certificates for surplus grain. Supply forage (hay) for big game animals to minimize damage to private agricultural crops, particularly during the winter following a drought. Manage Wildlife Areas to provide additional forage for wildlife as necessary, such as reducing grazing leases, especially on winter range.
- Fertilize rangeland to increase wildlife cover and forage during the following winter.
- Increase capability to capture and relocate dangerous wildlife that may come in close proximity to the public in search of food or water, or to flee wildfires.
- Construct fences and other exclusion structures to restrict wildlife access in selected areas where property damage is likely.
- Prioritize and implement actions to protect water sources for fish and wildlife, including:
- Where needed, temporarily impound or divert water to critical habitats or to upland watering devices
- Protect natural water sources by fencing and other infrastructure, such as piping and stock tanks, to provide water while preventing damage to sources

WDFW was heavily affected and therefore heavily involved with wildfires this fire season (see Enforcement Section as well). Wildfire on WDFW lands have caused enormous damage to lands and facilities on seven wildlife areas. Approximately 18,000 acres were burnt. The School Fire near Pomeroy has burnt nearly the entire Wooten Wildlife Area (over 16,000 acres) within Columbia and Garfield Counties. The fire was contained after burning 50,000 acres of habitat on multiple ownerships. Supplemental funds are

needed to address several issues resulting from this wildfire. Thirteen miles of elk fence on the Wooten Wildlife Area were destroyed and must be replaced. In addition, 30 miles of boundary fence have been destroyed. Water control, access structures, and campgrounds associated with several lakes adjacent to the Tucannon River on the Wooten Wildlife Area were damaged. Immediate rehabilitation will be required after a wildfire to control erosion, restore native perennial vegetation that has been lost, and limit the spread of noxious weeds to provide suitable habitat for fish and wildlife. This includes seeding and planting vegetation, fertilizing, weed control, and the establishment of water bars and other erosion control measures. These efforts are underway.

The loss of 13 miles of elk fence on the Wooten Wildlife Area, along with the loss of elk forage, will likely lead to significant damage to private agricultural lands caused by 1000 elk as well as deer and bighorn sheep that use the area. The elk fence keep big game from moving from public lands to private lands. Boundary fencing must also be replaced to keep cows from adjacent private and forest service lands from moving onto the wildlife area and damaging sensitive shrub steppe and riparian habitats. Healthy riparian habitat on the Wooten Wildlife Area is critically important to protect federally listed salmonids in the Tucannon River system. Cows will increase siltation into streams, destabilize stream banks, and destroy critical riparian vegetation and stream cover.

WDFW has been involved in water conservation in many ways. Most notable is the effort described below to develop an accurate inventory of WDFW water rights with the intent of reducing withdrawals and where feasible committing un-used water rights to trust water for instream flows. The Oak Creek/Tieton River on Highway 12 near Naches emergency pumping facility, funded with drought funds, is intended to provide a means to end pumping in Oak Creek during periods of low flows. This project will benefit steelhead trout rearing in Oak Creek, while at the same time ensure fire protection for buildings and grounds and augment flows into a wetland at the Wildlife Area.

WDFW boating access sites at streams and lakes across the state were affected by low water and in many cases were unsafe, damaging to boats and trailers, or unusable. In order to ensure continued and safe access during the drought, we repaired or replaced four boat ramps using emergency drought funds (Appendix 6). We also posted signs at many ramps, warning boaters to use caution or defer using our ramps because of low water (Appendix 5).

Water Conservation and Management

- Manage agency surface and ground water appropriations to minimize adverse impacts of the drought on fish and wildlife.

WDFW's Water Team within the Habitat Program has been conducting an inventory of all WDFW owned water rights. We have identified over 1,300 WDFW water rights for hatcheries, fishways, wildlife lands and other uses. One of the purposes of the inventory is to better manage our existing water rights, especially in those areas where habitat

needs for water are critical. Our list can be searched by area, facility or application number and offers users an opportunity to identify all known WDFW water rights, quantity, purpose of use, location, etc. During drought years this database helps us to identify and assess Department water rights that might be available for trust or instream flows.

- Reduce the consumption of potable water at WDFW buildings and lands

WDFW is promoting sustainability of water at our buildings and lands, especially the reduction in use of potable water. WDFW intends to conserve water through reduction and reuse, understand current water usage and develop plans for conservation, rainwater capture, reuse, and reclamation, and identify new water saving technology. We will conduct such activities as incorporation of gray water use in new facilities, reducing lawn watering, increasing the use of xerophytic landscaping, fixing leaks, switching to low water use toilets, and using faucet aerators. The WDFW Milestone: Potable water usage reduced by 10% by 2009.

Endangered Species Act and Essential Fish Habitat

- Ensure that drought-related protection measures do not result in an unauthorized take of fish and wildlife protected under the Endangered Species Act (ESA) and do not result in an adverse impact to Essential Fish Habitat (EFH) as defined in the Magnuson/Stevens Fishery and Conservation and Management Act (MSA).

WDFW worked with the federal Army Corps of Engineers (Corps), NOAA Fisheries, and the Fish and Wildlife Service (FWS) to develop a protocol for obtaining Corps permits that complied with the federal Endangered Species Act and the Magnuson/Stevens Fishery Conservation and Management Act. ESA and MSA both require the Corps to consult with NOAA Fisheries to protect ESA-listed species and for Magnuson/Stevens, to protect “essential fish habitat” (EFH) for fish species managed under the act. The protocol recognized the need for rapid permitting for fast-breaking fish passage and water supply projects that were under Corps permit jurisdiction. The Corps used the Nationwide Permit #27 (Stream and Wetland Restoration Activities) pre-construction notification (PCN) process for the permit application. Two programmatic consultations with the Services were used to meet ESA/EFH consultation requirements.

WDFW did a programmatic analysis of the effects of its anticipated drought-response activities and triggered PCNs on 7 projects (Appendix 7). Corps permits were issued very promptly by e-mail, usually within a week or less. The email authorizations were followed up by written permits within days of the request. All parties reviewed the process on October 21, 2005 and notwithstanding some minor glitches and refinements, felt the process met its objective of protecting ESA/EFH species while reacting quickly to WDFW fish passage and fish facility maintenance needs.

WDFW Hydraulic Code and State Environmental Policy Act

- Ensure that the drought-related fish and wildlife protection projects undertaken by WDFW are in compliance with the state Hydraulic Code.
- Ensure that the drought-related fish and wildlife protection projects undertaken by WDFW are in compliance with the State Environmental Policy Act.

WDFW amended the 2001 State Environmental Policy Act Declaration of Non-significance on May 4, 2005, filed a Joint Aquatic Permit Application Form (JARPA) on May 13, 2005, and obtained a statewide Hydraulic Project Approval (HPA) for drought-related fish-protection projects on June 7, 2005. The HPA authorized WDFW biologists to undertake or supervise activities such as temporary channel modifications, beaver dam and rock dam modifications or removals, fishway installation and modification, pump intake maintenance, and modification of pumps, wells, rearing ponds and other structures related to fish hatchery facilities. The HPA required prior notification of the area habitat biologist and additional provisions as needed based on site-specific conditions.

Shoreline Management Act

- Ensure that drought-related fish and wildlife protection projects undertaken by WDFW are in compliance with the state Shoreline Management Act (SMA).

WDFW applied for and obtained exemptions for anticipated instream projects subject to SMA in Snohomish, King, Pierce, Cowlitz, Klickitat, Kittitas, and Walla Walla counties. In most cases WAC 173-27-040 (correction of fish passage blockages) allowed WDFW projects to be exempted from the need to obtain substantial development permits under SMA.

Public Education and Outreach

Provide education and information about the impacts of drought on fish and wildlife and the agency.

The Public Affairs Division assigned a media staff person to provide information and education support for the Internal Drought Response Coordination Team and that person also was a member of the Drought Response Team. The agency participated in the drought Joint Information and Education Task Force, headed by Ecology, which includes several state agencies and the Governor's Office. The center released weekly updates on drought. WDFW provided information for seven of these news releases. Drought issues were included in three editions of the WDFW "Weekender" a weekly news release that provides information on fish and wildlife recreational opportunities. WDFW also generated independent news releases on the effects of recreational rock dams on fish.

WDFW's drought response is featured on the agency's web page and is linked from Ecology's web page. We featured the Box Canyon fish passage project on the November edition of Wild about Washington, which is distributed to public television stations statewide. The Fish and Wildlife Commission's June 17, 2001 meeting, which was televised on TVW, the state government television channel and a local television station, included a drought presentation. In addition, the Drought Response Coordinator and Drought Response Team members provided interviews to several newspapers. We were covered twice on National Public Radio and had a recreational rock dam removal project featured by three Seattle television stations. We also contributed to drought-related news releases with King County and the Central Puget Sound Water Suppliers Forum.

WDFW printed and had posted hundreds of laminated weatherproof "Let 'em pass" posters statewide (see Appendix 5). We engaged an intern to develop an educational sign warning of the negative impacts to bull trout and other salmonids of constructing small rock and other debris dams across rivers and streams. They were usually hand-built dams constructed of streambed rocks and cobbles or logs and usually in or near public campgrounds. These signs have been posted throughout the state at locations such as on park or campground bulletin boards, in those areas where recreational dams have become a chronic problem for fish passage and survival. They notify the public that these structures are illegal and are harmful to fish. The combination of posters, guidance from campground staff and WDFW biological staff and enforcement officers was successful in reducing the numbers and sizes of these dams. We also developed a sign that was posted after a drought project was completed, notifying the public that the work instream was an emergency drought project.

WDFW also posted warning signs at numerous WDFW boating access ramps, warning the public of the dangers of launching and retrieving boats during low water situations. Many boat ramps across the state were difficult and unsafe to use because water levels left the ramp ends short of the water (Appendix 5).

WDFW participated in the four public meetings conducted by the Executive Water Emergency Committee. These meetings were held in Wenatchee (May 26), Yakima (June 14), Clayton - near Spokane (July 27) and Port Angeles (August 30). These meetings allowed citizens and local agency staff the opportunity to meet the agencies' policy staff and to share concerns and ideas about how to best manage drought issues in the area.

Enforcement

WDFW enforcement staff should coordinate with agency programs, other agencies and the public to provide an efficient and effective enforcement response for minimizing the effects of drought on fish, wildlife, public safety and public and private property. Specifically:

- Provide enforcement presence to combat animal damage and to deal with dangerous wildlife.
- Provide enforcement presence on WDFW lands to combat fire threat, and coordinate WDFW assistance for wildfire suppression.
- Provide enforcement presence on spawning streams, and in fisheries due to vulnerability of salmon stocks.
- Provide enforcement presence to address additional Hydraulic Project Approval issues.

The Enforcement Program was able to take the actions described above, with emphasis to respond to dangerous wildlife first, fire threat second, streams containing ESA-listed or SaSI- critical stocks third, and big game animal damage fourth. Enforcement staff coordinated and shared information well with regional and headquarters staff on these issues.

Enforcement staff was assigned to the Division of Emergency Management Emergency Command Center, in South Eastern Washington for the “School Fire”. We provided the Command Center with supervisory assistance for Fish and Wildlife Officers. The Enforcement Program deployed 21 officers to assist local law enforcement and fire personnel with evacuations, and roadblocks. These duties continued with local law enforcement and fire personnel for approximately two weeks and involved 12 to 14 hour shifts, with a total of 1,359 officer hours. The School Fire caused an enormous amount of damage to department lands, habitat and other property. A list of WDFW available resources for fire response was provided to the command center. These resources included such things as ready water sources (standpipes for filling tanker trucks, either gravity feed or pump supply, or ponds that can be used as a water source), portable water pumps, fish planting trucks that may be used for hauling water (300-2000 gallon capacity), heavy equipment, power and hand tools, boats of various sizes and capabilities, communications equipment capability, and staff and vehicles that may be provided for ancillary fire suppression activities. We also provided enforcement presence during several eastern Washington wildfires this season. It should be noted that WDFW personnel are neither trained nor equipped for formal fire suppression efforts. We rely upon other state or local entities for fire suppression. However, most wildlife area and hatchery staff is capable of providing immediate fire suppression efforts for wildfires that may threaten WDFW facilities.

Enforcement personnel recognized an increase in Big Game Animal Damage in Kittitas County, Reg. 3. Elk in this area moved from higher elevations to irrigated crop fields that were adjacent to the Yakima River and its tributaries. Officers worked with and collaborated with local landowners to assist them with prevention of potential crop loss and damages issues.

Officers recognized an increase in illegal stream diversions and blockages on a statewide basis and communicated with the fish and habitat programs to identify the locations of concern. A significant number of these situations involved swimmers attempting to block

stream flows for swimming activities. Officers provided education to the public on the potential impacts of these activities and in some areas removed minor diversions.

Increased illegal use of streambeds by vehicles was also observed by enforcement personnel on streams across the state. Officers again provided education on potential damage to the habitat and fish spawning areas. Enforcement actions were taken on some individuals on these contacts.

Drought Contingency Plan Review **And Adaptive Management**

Early planning and organization coupled with adequate staffing and funding contributed, to an effective WDFW response to the 2005 drought emergency. However, it is difficult to predict the actual end of the climatic drought, some experts feel this may be more than a one-year phenomenon. The Drought Committee will remain functional for a short period after the end of this drought emergency to assess the agency's response to drought, the impacts of the drought on fish and wildlife and agency operations and revenue, and to employ adaptive management as necessary to allow WDFW to manage future drought emergencies. For example, based in part upon the 2001 drought response, WDFW began preparing for the drought well in advance of the actual drought declaration. This allowed us to identify and implement several early action projects during the early stages of the drought. Quick intervention, especially at our fish rearing facilities likely prevented significant disease out-breaks and reduced the need for fish relocation. This information lessons learned, and final project descriptions and costs incurred during 2005 will be added to the 2001 Plan and filed with the Intergovernmental Policy unit of the Director's office for future reference and use.

WDFW 2005 DROUGHT RESPONSE CLOSE-OUT REPORT

APPENDICES 1-7

APPENDIX 1.

WDFW 2005 Proposed Early Action Drought Projects

Hatchery water supply	
Elochoman hatchery diversion structure modifications	8,500
Washougal hatchery increased pumping	10,000
Grays River hatchery oxygenation	2,000
Goldendale hatchery water supply spring rehabilitation	7,000
Mossyrock hatchery increased pumping	2,500
North Toutle hatchery holding pond improvements	13,500
Kendall Creek hatchery flow supplementation	12,000
Wallace River hatchery aeration	4,500
Marblemount hatchery flow supplementation	6,500
Lake Whatcom flow supplementation	2,500
Vancouver hatchery increased pumping	10,000
Elochoman hatchery holding pond modification	4,500
Colville hatchery groundwater supply modifications	10,500
subtotal	\$94,000
Fish disease treatment	
Kalama falls disease control salt	2,000
Skamania hatchery disease control formalin	10,000
subtotal	\$12,000
Water access sites	
Samish Lake access ramp extension	20,000
Big Lake access ramp sediment removal (Skagit County)	2,500
Clear Lake access ramp extension (Thurston Co.)	12,000
Clear Lake access ramp extension (Spokane Co.)	5,000
Lake Isabella access ramp extension (Mason Co.)	12,000
Williams Lake access ramp extension (Spokane Co.)	5,000
Access area drought safety signage	1,000
subtotal	\$57,500
Fish salvage and transfer operations	
S.E. Washington fish salvage operations	12,000
Klickitat falls fishway 5 trap improvements	12,500

subtotal	\$24,500
Fishery and stream monitoring	
Umatilla spring Chinook fishery monitoring	\$12,000
subtotal	\$12,000
Grand Total	\$200,000

APPENDIX 2.

WDFW 2005 Drought Proposed Projects Budget Amendment

<u>Hatchery Water Supply</u>			
Lake Whatcom Flow Supplementation	WRIA 1	1,200	
Kendall Creek Hatchery– Phase 2 Flow Supplementation	WRIA 1	12,000	
Marblemount Hatchery – Phase 2 Flow Supplementation	WRIA 4	9,000	
Elwha Hatchery - Well Supplementation	WRIA 18	20,000	
Puget Sound and Coastal Hatcheries Dissolved Oxygen Meters	WRIA 1-24	15,000	
Goldendale Spring and Hatchery Resealing – Phase 2	<u>WRIA 30</u>	15,000	
Aeneas Lake Aeration Units	WRIA 49	3,000	
Colville Hatchery Well - Phase 2	WRIA 59	23,000	
	subtotal:		\$98,200
<u>Fish Disease Treatment</u>			
Bellingham Hatchery	WRIA 1	4,000	
Soos Creek Hatchery	WRIA 9	11,720	
Voights Creek Hatchery	WRIA 10	5,860	
	subtotal:		\$21,580
<u>Fish Salvage and Transfer Operations</u>			
Voight's Creek Adult Trap	WRIA 10	18,000	
	subtotal:		\$18,000
<u>Temporary Fish Passage Modifications</u>			
Canyon Creek	WRIA 01	4,800	
Padden Creek	WRIA 01	4,800	
Samish River	WRIA 02	11,600	
Skagit River	WRIA 04	14,600	

Stillaguamish River	WRIA 05	14,600	
Grant Creek	WRIA 05	4,600	
Squire Creek	WRIA 05	6,700	
Jim Creek	WRIA 05	6,800	
Canyon Creek	WRIA 05	6,830	
SF Stillaquamish River	WRIA 05	4,000	
Granite Falls Fishway Maintenance	WRIA 05	5,200	
Pilchuck River	WRIA 07	14,600	
Raging River	WRIA 07	6,800	
Wallace River	WRIA 07	6,800	
Sammamish River	WRIA 08	6,800	
Bear Creek	WRIA 08	4,800	
Evans Creek	WRIA 08	4,800	
Cottage Creek	WRIA 08	4,800	
Issaquah Creek	WRIA 08	6,800	
Coal Creek	WRIA 08	9,000	
Rock Creek	WRIA 09	4,800	
Newaukum Creek	WRIA 09	6,800	
Puyallup River	WRIA 10	14,600	
Clarks Creek	WRIA 10	4,800	
White River	WRIA 10	14,600	
Boise Creek	WRIA 10	4,800	
Clearwater River	WRIA 10	11,600	
Greenwater River	WRIA 10	11,600	
Fennel Creek	WRIA 10	4,800	
Carbon River	WRIA 10	11,600	
South Prairie Creek	WRIA 10	6,800	
Gale Creek	WRIA 10	4,800	
Fiske Creek	WRIA 10	4,500	
Kapowsin Creek	WRIA 10	4,800	
Fox Creek	WRIA 10	4,500	
Chimacum Creek	WRIA 17	11,300	
Snow Creek	WRIA 17	4,800	
Salmon Creek	WRIA 17	4,800	
Dungeness River	WRIA 18	11,600	
Gray Wolf River	WRIA 18	11,600	
Elwha River	WRIA 18	11,600	
Clallam River	WRIA 19	11,600	
Quillayute River	WRIA 20	11,600	

Hoh River	WRIA 20	11,600	
Toutle River	WRIA 26	14,600	
Washougal River	WRIA 28	3,960	
Hamilton Springs	WRIA 28	4,900	
Washougal River	WRIA 28	21,300	
Duncan Creek	WRIA 28	10,400	
Swale Creek	WRIA 30	4,800	
Little Klickitat River	WRIA 30	11,600	
Walla Walla River	WRIA 32	30,000	
Rattlesnake Creek	WRIA 38	5,000	
Wenatchee River	WRIA 45	2,500	
Chiwakum River	WRIA 45	2,500	
Peshastin Creek	WRIA 45	2,500	
Chumstick Creek	WRIA 45	2,500	
Entiat R. (Knapp-Wham and Hamma Divs.)	WRIA 46	2,500	
Entiat R. (McKenzie Divs. Over Check Dam)	WRIA 46	2,500	
Entiat River	WRIA 46	5,000	
Mad River	WRIA 46	2,500	
Roaring Creek	WRIA 46	2,500	
25 Mile Creek	WRIA 47	2,500	
Chelan River	WRIA 47	2,500	
First Creek	WRIA 47	1,000	
Beaver Creek	WRIA 48	3,000	
Gold Creek	WRIA 48	2,500	
Trinidad Creek	WRIA 48	2,500	
Wolf Creek	WRIA 48	2,500	
Beaver Creek (Wenatchee River)	WRIA 48	2,500	
Unidentified Contingency Temporary Fish Passage Projects	VARIOUS WRIAS	156,030	
	subtotal:		\$662,220
	GRAND TOTAL		\$800,000

Appendix 3. WDFW 2005 Drought - Temporary Fish Passage Modifications Completed – Approximate Costs

Canyon Creek Flow Aggregation	WRIA 01	2,500
South Fork Nooksak Flow Aggregation	WRIA 01	2,500
Granite Falls Fishway Maintenance	WRIA 05	5,200
Raging River Rock Dam Removal/Modifications	WRIA 07	6,800
Kalama River Channel Modification	WRIA 27	30,000
Hamilton Springs Reed Canary Grass Removal	WRIA 28	4,900
Hardy Creek Reed Canary Grass Removal	WRIA 28	3,500
Duncan Creek Fishway Modification, Reed Canary Grass Removal and Flow Aggregation	WRIA 28	10,400
Lower Washougal Flow Deflectors	WRIA 28	30,000
Klickitat River Lyle Falls Fishway Flow Augmentation	WRIA 30	15,000
Box Canyon Creek Flume (USBR funding)	WRIA 39	7,000
Gold Creek Flow Aggregation	WRIA 39	2,500
Taneum Creek Rock Dam Removal/Modifications	WRIA 39	2,500
	Total	\$122,800

Appendix 4. WDFW 2005 Drought - Hatcheries Projects Completed

Lake Whatcom Flow Supplementation (WRIA 1)

- Provided pumped lake water as replacement for water that would normally be obtained by gravity from Brannion Creek to serve as flow augmentation.

Approximate costs: \$3,700

Expected future expenditures: none at this time.

Bellingham Hatchery Fish Disease Treatment (WRIA 1)

- The drought caused low water flows and elevated water temperature conditions to the Bellingham Hatchery. The water supply for this facility is Lake Whatcom, a surface water supply with naturally produced salmonids and other fish species present that harbor fish pathogens.
- Because of these stressful rearing conditions caused by the drought, the trout being reared at this facility are more susceptible to bacterial and parasitic epidemics (e.g.: *Columnaris* and *Ichthyophthirus*).
- This years' drought caused elevated water temperatures from Lake Whatcom, the hatchery's water supply. Elevated water temperatures have been demonstrated to

cause additional stress to the fish being reared at the hatchery resulting in an increase of bacterial and parasitic epizootics (e.g.: Columnaris and Ichthyophthirus).

- This project allowed for the purchase of formalin to treat "ich" and salt to act as a stress mediator for returning ESA listed adult fall chinook. It also allowed for the purchase of Romet medicated feed and fish pills to dispense medication to treat Columnaris.

Approximate costs: \$11,700

Expected future expenditures: \$0

Kendall Creek Hatchery (WRIA 1)

- Utilize well water to compensate for reduced gravity flows from Kendall Creek.
- Utilizing this water allows existing program to be maintained.

Approximate costs: \$24,000

Expected future expenditures: \$ 0

Marblemount Hatchery (WRIA 3)

- Utilize well water to compensate for reduced gravity flows from Jordan Creek.
- Utilizing this water allows existing program to be maintained.

Approximate costs: \$15,000

Expected future expenditures: None at this time

Elwha Hatchery (WRIA 18)

- Tap into well water line and install two packed columns approximately half way down the spawning channel to provide cooler water for ESA listed adult fall chinook.
- This action is intended to provide better water circulation, decrease epidemics, reduce chemical usage, and improve juvenile rearing.

Approximate costs: \$20,000

Expected future expenditures: \$0

Puget Sound and Coastal Hatcheries Dissolved Oxygen Meters

- Purchase dissolved oxygen meters for use in multiple hatcheries to monitor dissolved oxygen levels during critical rearing periods.
- Maintaining adequate dissolved oxygen levels in hatchery rearing vessels is critical to the success of the rearing programs.
- By monitoring DO levels, stress and potential epidemics can be reduced which results in less use of drugs and chemicals.
- DO meters were purchased for the Minter Creek/hood Canal, Mt. Baker, Dungeness/Solduc, and Rainier hatchery complexes.

Approximate costs: \$12,000

Expected future expenditures: \$0

Goldendale Spring and Hatchery Resealing (WRIA 30)

- The desired outcome is to maintain water flow to rainbow trout during drought period.
- Drought conditions have impacted spring recharge rates and resulting in lower than expected flows. The current spring intake box and pipeline leak excessive amounts of water during these drought conditions. The project is designed to reseal the spring intake box and pipeline to the hatchery.
- Flow measurements were taken at the spring headbox, the hatchery and in Spring Creek at points upstream and downstream of the hatchery. These measurements indicated that despite attempts to seal leaks in the pipeline and headbox, water was still not being fully captured.
- Aerators were purchased and electrical service provided to them to compensate for reduced flows.

Approximate costs: \$18,000

Expected future expenditures: \$0

Colville Hatchery Well (WRIA 59)

- Pump renovation to provide hatchery with backup water supply during drought conditions.
- The existing hatchery water supply was a single well that was in jeopardy of running dry.
- There was an existing well that was not operable and this project will complete the renovation of that well and provide piping to the hatchery distribution system.
- Phase 1 of this project was provided funding and this phase incorporates a detailed budget developed by WDFW Engineering staff.
- Phase 2 of the project completed the tie-in of the well to the hatchery water supply.

Approximate costs: \$32,000

Expected future expenditures: \$5,000 (for annual operations)

Elochoman Hatchery Modifications (WRIA 25)

- This project modified the adult holding pond using eco-blocks to better control flow and reduce stagnant water areas in an effort to reduce adult fall chinook salmon stress and mortality.

Approximate costs: \$8,000

Expected future expenditures: \$0

Washougal Hatchery Water Supply (WRIA 28)

- Additional water pumps were turned on to allow the existing program to be held until optimal release times.
- Without the ability to turn on these pumps, the fish would have had to been released early because of reduced stream flows in the Washougal River and low flows early in the spring from spring water intakes.

Approximate costs: \$10,000

Expected future expenditures: \$0

Grays River Hatchery Oxygenation (WRIA 25)

- The existing hatchery water supply was in jeopardy of running dry, however flows maintained during the summer at reasonable levels and this project did not need to be done.

Approximate costs: \$0

Expected future expenditures: \$0

Mossyrock Hatchery (WRIA 26)

- The existing hatchery water supply is a spring well that was in jeopardy of running dry, however flows maintained during the summer at reasonable levels and this project did not need to be done.

Approximate costs: \$0

Expected future expenditures: \$0

North Toutle Hatchery Well (WRIA 26)

- Drought conditions have impacted surface water flows in the North Fork Toutle River. This project purchased aerators to provide for additional aeration of water in the lower half of production raceways.

Approximate costs: \$3,520

Expected future expenditures: \$0

Kalama Falls Disease Control (WRIA 27)

- This project provided salt to be added to the hatchery water supply to act as a stress mediator. Reducing stress during poor water quality conditions has been demonstrated to reduce epidemics at this facility.
- Reducing epizootics results in the use of fewer antibiotics and chemicals to treat epizootics.

Approximate costs: \$2,000

Expected future expenditures: \$0

Skamania Hatchery Disease Control (WRIA 28)

- This project provided formalin and salt to be added to the hatchery water supply.
- Salt was used to act as a stress mediator. Reducing stress during poor water quality conditions has been demonstrated to reduce epidemics at this facility.
- Reducing epizootics results in the use of fewer antibiotics and chemicals to treat epizootics.
- Experience at this facility has shown that when poor water conditions are present they are conducive to ectoparasite epidemics. Formalin was used as a preventative measure to treat for ectoparasites and prevent epidemics.

Approximate costs: \$9,000

Expected future expenditures: \$0

Voight's Creek Hatchery Adult Trap (WRIA 10)

- Low stream flows caused by the drought adversely impacted adult fall chinook migration into the Voights Creek Hatchery trap
- This project placed a weir across Voights Creek that in turn directed returning adults into the hatchery trap.
- Because of the low flows, adult fall chinook were hesitant to move upstream in Voights Creek making every fish valuable to meet egg take needs.
- This project was instrumental in the hatchery achieving their egg take goal.

Approximate costs: \$18,000

Expected future expenditures: \$12,000 (for annual operations, separate fund source)

Voight's Creek Hatchery Fish Disease Treatment (WRIA 10)

- The drought caused low water flows and elevated water temperature conditions to the Voight's Creek Hatchery. Because of these stressful rearing conditions, the salmon being reared at this facility are more susceptible to bacterial and parasitic epidemics (e.g.: Furunculosis and *Ichthyophthirus*).
- This project allowed for the purchase of formalin to treat "ich" and salt to act as a stress mediator for returning ESA listed adult fall chinook. It also allowed for the purchase of Romet medicated feed and fish pills to dispense medication to treat Furunculosis.

Approximate costs: \$5,800

Expected future expenditures: \$0

Soos Creek Hatchery Fish Disease Treatment (WRIA 9)

- The drought caused low water flows and elevated water temperature conditions to the Soos Creek Hatchery. The water supply for this facility is a surface water supply with naturally produced anadromous salmonids present that harbor fish pathogens.
- Because of these stressful rearing conditions caused by the drought, the salmon being reared at this facility are more susceptible to bacterial and parasitic epidemics (e.g.: Furunculosis and *Ichthyophthirus*).
- This project allowed for the purchase of formalin to treat "ich" and salt to act as a stress mediator for returning ESA listed adult fall chinook. It also allowed for the purchase of Romet medicated feed and fish pills to dispense medication to treat Furunculosis.

Approximate costs: \$11,700

Expected future expenditures: \$0

Elwha Hatchery Weir (WRIA 18)

- Low stream flows caused by drought adversely impact adult fall chinook migration in the Elwha River and into the Elwha hatchery.
- This project constructed a weir for placement across the Elwha River to capture returning ESA listed fall chinook salmon adults.

- The weir was not installed, but fabricated for use in subsequent years.

Approximate costs: \$ 60,000

Expected future expenditures: \$ 18,000 (for annual operations, separate funds)

Gray Wolf Rearing Pond (WRIA 18)

- Restored water flows to rearing pond intake for ESA listed fall chinook acclimation pond.
- Low flows had isolated the intake making these renovations necessary.

Approximate costs: \$ 15,000

Expected future expenditures: \$20,000 (for annual operations, separate fund source)

Kokanee Trap Nets (WRIAs 12, 14 and 47)

- This project purchased two net pen traps, to set them up off the mouths of the feeder streams of selected lakes and fish them to collect broodstock for use in the statewide kokanee program.
- The capture of kokanee broodstock is vital to the continuation of the 35 million dollar kokanee recreational fishery in Washington State. Kokanee spawn in fall months and seasonal low flows caused by drought conditions can limit, or eliminate, the ability to capture broodstock in streams.
- Kokanee school off the mouths of the broodstock collection creeks and are lost to broodstock collection without a floating net trap to capture them as they cruise the shore.
- Fish the net traps to capture kokanee broodstock in order to help meet the Fish Program kokanee egg goals.

Approximate costs: \$ 22,000

Expected future expenditures: \$9,500 (for annual operations, separate fund source after 2005)

Vancouver Hatchery Pumping (WRIA 28)

- Low precipitation during the spring of 2005 failed to adequately recharge the aquifer supplying water to the Vancouver Hatchery.
- This project provided funding to turn on wells during a period they would not normally have been in operation. This resulted in fish being held for an appropriate length of time and allowing the facility to meet existing program goals

Approximate costs: \$ 10,000

Expected future expenditures: \$0

Wallace River Hatchery Aeration (WRIA 7)

- Low precipitation during the spring of 2005 failed to adequately recharge the aquifer supplying water to the Wallace River Hatchery.
- Due to low head in the river, pump efficiencies were reduced and this project provided funding to turn on additional pumps to supply water to existing fish rearing programs.

- Having this water available reduced stress, prevented epidemics, and increased survival over low flow periods.

Approximate costs: \$ 4,500

Expected future expenditures: \$0

Baker River Sockeye (WRIA 4)

- Low precipitation during the winter and spring of 2005 failed to adequately recharge the aquifer supplying water to the Baker River Sockeye Hatchery.
- This project provided for the installation of intermediate raceways for rearing sockeye to replace facilities that were not operational due to low flows.
- These raceways allowed for the short term rearing of sockeye to improve survival and replace lost production.

Approximate costs: \$ 14,000

Expected future expenditures: unknown

TOTAL APPROXIMATE COSTS: \$329,920

TOTAL EXPECTED 2005 FUTURE EXPENDITURES: \$9500

Appendix 5. Signs Produced for Drought Response:

Boating Access sign, “Let‘em pass” sign, and Drought Project sign



LET 'EM PASS!

Rock dams are harmful to fish and illegal

Due to this year's drought, many streams are lower than normal. Dams like the one below built of rocks are both illegal and harmful to salmon, bull trout, and other native fish that go upstream to lay their eggs.

To make sure fish survive for the future, we need your help. Please do not build dams or other structures within the stream. Report incidents of dam building to your local Washington State Patrol or Washington Fish and Wildlife office.



Rock dam on Box Canyon Creek that blocked adult bull trout migration in 2001

For more information on the effects of drought on fish and wildlife, see the Washington Department of Fish and Wildlife's drought website at:

<http://wdfw.wa.gov/drought/>



Appendix 6. Boating Access Ramp Maintenance/Replacement

Clear Lake	Thurston County	Ramp Extension	12,000
Clear Lake	Pierce County	Ramp Replacement	30,000
Williams Lake	Spokane County	Ramp Extension	5,000
Clear Lake	Spokane County	Ramp Extension	5,000
		Total	\$52,000

Appendix 7. Corps of Engineers NWP 27 Permits

PROJECT	LOCATION	ACTIVITY	ESA/EFH SPECIES	DATE APPLIED	DATE AUTHORIZED	DATE COMPLETED
CANYON CREEK	Tributary to NF Nooksak	Flow Deflection Rearrange Cobbles at Cascade	PS Chinook, PS Pink, Coho, Bull Trout, SO, MM, BE	8/3/05	8/10/05	8/10/05, 3 hrs
RAGING RIVER	Raging River at Snoqualmie River	Remove Illegal Rock Dams, Rearrange Cobbles Into Passage Weir	PS Chinook, PS Pink, Coho, Bull Trout, SO, MM, BE	8/19/05	8/24/05	8/25/05, 3 hrs
GOLD CREEK/LAKE KEECHELUS	Tributary to Lake Keechelus at Snoqualmie Pass	Flow Deflection, Rearrange Cobbles to aggregate flow	Bull Trout, SO, MM, BE	9/7/05	9/8/05	9/9/05 8 hrs
SF NOOKSAK RIVER	RM 14 at Skookum Creek	Flow Deflection Rearrange cobbles to aggregate flow	PS Chinook, PS Pink, Bull Trout, Coho, SO, MM, BE	10/1/05	10/4/05	Cancelled, flows came up 10/6-7/05, project not necessary
KALAMA RIVER	Kalama River at Columbia	Excavate Channel Through Bar	LCR Chin, LCR Sthd, CR Chum, Coho, Bull Trout, SO, MM, BE	10/3/05	10/9/05	Scheduled for 10/31/05
KLICKITAT RIVER	Klickitat River at Lyle Falls	Extend Wing-wall, Excavate	MCR Sthd, Bull Trout,	10/7/05	10/7/05	Scheduled for 11/1/05

GRAY WOLF RIVER		Bar to provide additional flow to fishway	Chinook, Coho, SO, MM, BE			
	Gray Wolf River at RM 2.1	Excavate Inlet To Chinook Acclimation Pond	PS Chin, Coho, HC/SJF Summer Chum, Bull T, SO, MM, BE	10/20/05	10/20/05	11/1/05 4 days